UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/599,574	05/21/2007	Dennis May	042933/388814	1966

826   7590   09/27/2010
ALSTON & BIRD LLP
BANK OF AMERICA PLAZA
101 SOUTH TRYON STREET, SUITE 4000
CHARLOTTE, NC 28280-4000

EXAMINER
LEE, ADAM

ART UNIT	PAPER NUMBER
2195	

MAIL DATE	DELIVERY MODE
09/27/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/599,574	MAY, DENNIS
	Examiner	Art Unit	
	ADAM LEE	2195	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>02 October 2006</u>.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-31</u> is/are pending in the application.

　　4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-31</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>24 June 2008</u> is/are: a)☐ accepted or b)☒ objected to by the Examiner.

　　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

　　Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　　a)☒ All　b)☐ Some * c)☐ None of:

　　　1.☒ Certified copies of the priority documents have been received.

　　　2.☐ Certified copies of the priority documents have been received in Application No. _____.

　　　3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

　　* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
　　Paper No(s)/Mail Date <u>03/07/06, 03/08/10</u>.

4) ☐ Interview Summary (PTO-413)
　　Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____ .

DETAILED ACTION

1.   Claims 1-31 are pending.

Drawings

2.   The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include reference numbers. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance. Appropriate correction is required.

Abstract

3.   The abstract of the disclosure does not commence on a separate sheet in accordance with 37 CFR 1.52(b)(4). A new abstract of the disclosure is required and must be presented on a separate sheet, apart from any other text.

Specification

4.   The specification is objected to because it is not written in proper format. The following

guidelines illustrate the preferred layout for the specification of a utility application. These

guidelines are suggested for the applicant's use:

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following
sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a
section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section
heading:

      (a) TITLE OF THE INVENTION.
      (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
      (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
      (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
      (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
      (f) BACKGROUND OF THE INVENTION.
          (1) Field of the Invention.
          (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
      (g) BRIEF SUMMARY OF THE INVENTION.
      (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
      (i) DETAILED DESCRIPTION OF THE INVENTION.
      (j) CLAIM OR CLAIMS (commencing on a separate sheet).
      (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
      (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required
          on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR
          1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on
          compact disc).

5.   The Specification is objected to because Figure 1 is not described and the steps in figures

2-4 are not described in detail. Appropriate correction is required.

6.   The title of the invention is not descriptive. A new title is required that is clearly

indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of
> matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions
> and requirements of this title.

7.   Claims 1-16 and 18-31 are rejected under 35 U.S.C. 101 because the claimed

invention is directed to non-statutory subject matter.

8.   As per claim 1, is directed to a device claim, but appears to be comprised of software

alone without claiming associated computer hardware required for execution. For example, claim

1 recites a scheduler and a locking mechanism. It is interpreted that both the scheduler and

locking mechanism are software modules / functions. Page 9, lines 5-7 of the Specification states

that the scheduler is within the operating system which is software per se. Software alone is

directed to a non-statutory subject matter. In addition, the examiner could find no support in the

Specification indicating that the locking mechanism could be hardware and thus interprets it to

be software per se. Applicant is advised to amend the claim to include hardware (i.e. processor

and memory) to overcome the 101 rejection.

9.   As per claims 2-16, they are dependent on claim 1 but do not cure any of the 101

deficiencies of claim 1. Therefore they are rejected using the same rationale.

10.   As per claim 18, it has similar limitations as claim 1 and is therefore rejected using the

same rationale.

11.   As per claims 19-31, they are dependent on claim 18 but do not cure any of the 101

deficiencies of claim 18. Therefore they are rejected using the same rationale.

35 USC § 112 Sixth Paragraph

12.   As per claim 18, it meets the requirements of 35 U.S.C. 112, sixth paragraph, because it

recites the phrase "means for" in line 7, the "means for" is modified by functional language (e.g.

arranging a scheduled thread in lines 7-8), and the "means for" is not modified by sufficient

structure, material, or acts for achieving the specified function.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the
> subject matter which the applicant regards as his invention.

13.   Claims 6, 9, 23, and 26 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention.

A. The following claims are vague and indefinite:

   i.   As per claim 6, line 2, it is unclear what is meant by "non-nestable locking

          mechanisms". The examiner could not find sufficient explanation in the

          Specification.

ii.   As per claim 9, lines 2-3, it is not clearly understood what is meant by

"replaceable memory model". The examiner could not find sufficient explanation

in the Specification.

iii. As per claim 23, it has similar deficiencies as claim 6.

iv. As per claim 26, it has similar deficiencies as claim 9.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth
> in section 102 of this title, if the differences between the subject matter sought to be patented and the prior
> art are such that the subject matter as a whole would have been obvious at the time the invention was made
> to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be
> negatived by the manner in which the invention was made.

14.   Claims 1-4, 7, 12, 17-21, 24 and 29 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Zolnowsky (US 5,826,081) in view of Vaidyanathan et al. (US 7,676,809)

(hereinafter Vaid).

15.   As per claim 1, Zolnowsky teaches the invention substantially as claimed including a

computing device comprising a scheduler (abstract, line 1) incorporating an algorithm for

ordering the running of threads of execution having different priorities (col. 1, lines 55-58); and

including a list of threads which are scheduled to run on the device, ordered by priority (col. 1,

lines 55-58); the device further comprising at least one locking mechanism for blocking access to

a resource of the device from all threads except for a thread that holds the locking mechanism

(col. 1, lines 59-67 to col. 2, lines 1-9).

16.   Zolnowsky fails to teach a scheduled thread which is blocked from running causes the

thread which holds the locking mechanism to run.

17.   However, Vaid teaches a scheduled thread which is blocked from running causes the

thread which holds the locking mechanism to run (col. 3, liens 65-67 to col. 4, lines 1-5).

18.   It would have been obvious to one of ordinary skill in the art at the time of the invention

to combine causing a thread holding the lock to run as taught by Vaid into the device as taught

by Zolnowsky because it would allow the thread holding the lock to run faster (see Vaid col. 4,

lines 4-5).

19.   As per claim 2, Zolnowsky further teaches wherein states are assigned to threads and the

list comprises of all threads having a common state (col. 6, lines 61-67 to col. 7, lines 1-6).

20.   As per claim 3, Zolnowsky further teaches a blocked thread is not permitted to change its

state (col. 6, lines 61-67 to col. 7, lines 1-6).

21.   As per claim 4, Zolnowsky further teaches the list is subdivided in accordance with the

priority of the threads it contains (fig. 8 and col. 9, lines 8-15).

22.   As per claim 7, Zolnowsky further teaches the scheduler is arranged to be called at the
end of an interrupt service routine which is caused to run on the computing device (col. 8, lines
61-64).

23.   As per claim 12, Zolnowsky further teaches the scheduler is included in a kernel of an
operating system of the computing device (col. 5, lines 26-31).

24.   As per claim 17, it has similar limitations as claim 1 and is therefore rejecting using the
same rationale.

25.   As per claim 18, it has similar limitations as claim 1 and is therefore rejecting using the
same rationale.

26.   As per claim 19, it has similar limitations as claim 2 and is therefore rejecting using the
same rationale.

27.   As per claim 20, it has similar limitations as claim 3 and is therefore rejecting using the
same rationale.

28.   As per claim 21, it has similar limitations as claim 4 and is therefore rejecting using the
same rationale.

29.   As per claim 24, it has similar limitations as claim 7 and is therefore rejecting using the same rationale.

30.   As per claim 29, it has similar limitations as claim 12 and is therefore rejecting using the same rationale.

31.   Claims 5 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zolnowsky in view of Vaid as applied to claims 1 and 18, and further in view Lake (US 2004/0045003).

32.   As per claim 5, Zolnowsky and Vaid fail to teach a thread is arranged to contain a pointer to any locking mechanism it is blocked on.

33.   However, Lake teaches a thread is arranged to contain a pointer to any locking mechanism it is blocked on ([0041], lines 7-18).

34.   It would have been obvious to one of ordinary skill in the art at the time of the invention to combine a pointer to the lock as taught by Lake into the device as taught by Zolnowsky and Vaid because it would provide a way to save memory and processor usage (see Lake abstract).

35.   As per claim 22, it has similar limitations as claim 5 and is therefore rejecting using the same rationale.

36.   **Claims 6, 13-14, 23, and 30-31 are rejected under 35 U.S.C. 103(a) as being**

unpatentable over Zolnowsky in view of Vaid as applied to claims 1 and 18, and further in

view of Magee et al. (US 5,729,710) (hereinafter Magee).

37.   As per claim 6, Zolnowsky and Vaid fail to teach a plurality of non-nestable locking

mechanisms.

38.   However, Magee teaches a plurality of non-nestable locking mechanisms (col. 47, lines

39-67).

39.   It would have been obvious to one of ordinary skill in the art at the time of the invention

to combine non-nestable locking mechanisms as taught by Magee into the device as taught by

Zolnowsky and Vaid because it would provide an improved microkernel architecture for a data

processing system (see Magee col. 4, lines 9-23).

40.   As per claim 13, Zolnowsky and Vaid fail to teach the kernel comprises a microkernel or

a nanokernel and where the threads are, respectively, microkernel or nanokernel threads.

41.   However, Magee teaches the kernel comprises a microkernel or a nanokernel (col. 8,

lines 15-19) and where the threads are, respectively, microkernel or nanokernel threads (col. 12,

lines 1-4).

42.   It would have been obvious to one of ordinary skill in the art at the time of the invention

to combine non-nestable locking mechanisms as taught by Magee into the device as taught by

Zolnowsky and Vaid because it would provide an improved microkernel architecture for a data

processing system (see Magee col. 4, lines 9-23).

43.   As per claim 14, Zolnowsky and Vaid fail to teach the scheduler is arranged to be called

each time the kernel is unlocked.

44.   However, Magee teaches the scheduler is arranged to be called each time the kernel is

unlocked (col. 40, lines 26-37).

45.   It would have been obvious to one of ordinary skill in the art at the time of the invention

to combine non-nestable locking mechanisms as taught by Magee into the device as taught by

Zolnowsky and Vaid because it would provide an improved microkernel architecture for a data

processing system (see Magee col. 4, lines 9-23).

46.   As per claim 23, it has similar limitations as claim 6 and is therefore rejecting using the

same rationale.

47.   As per claim 30, it has similar limitations as claim 13 and is therefore rejecting using the

same rationale.

48.   As per claim 31, it has similar limitations as claim 14 and is therefore rejecting using the

same rationale.

49.   Claims 8-11 and 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Zolnowsky in view of Vaid as applied to claims 1 and 18, in view of Lake, and further

in view of Dahlstedt et al. (US 7,080,374) (hereinafter Dahlstedt).

50.   As per claim 8, Zolnowsky and Vaid fail to teach the locking mechanism(s) comprise(s) a

mutex including a pointer, which is null if the mutex is free or points to the thread holding the

mutex, and includes a flag indicating whether or not the mutex is contested.

51.   However, Lake teaches the locking mechanism(s) comprise(s) a mutex including a

pointer ([0041], lines 7-13), which is null if the mutex is free or points to the thread holding the

mutex ([0041], lines 13-18).

52.   It would have been obvious to one of ordinary skill in the art at the time of the invention

to combine the lock as taught by Lake into the device as taught by Zolnowsky and Vaid because

it would provide a way to save memory and processor usage (see Lake abstract).

53.   Zolnowsky, Vaid and Lake fail to teach includes a flag indicating whether or not the

mutex is contested.

54.   However, Dahlstedt teaches includes a flag indicating whether or not the mutex is

contested (col. 2, lines 14-20).

55.   It would have been obvious to one of ordinary skill in the art at the time of the invention

to combine a flag as taught by Dahlstedt into the invention as taught by Zolnowsky, Vaid and

Lake because it would ensure that preemptive thread switching is not preformed within lock

regions (see Dahlstedt col. 2, lines 25-32).

56.   As per claim 9, Zolnowsky further teaches the algorithm is arranged to delegate memory

management to a replaceable memory model configured in dependence upon the configuration of

the computing device (col. 4, lines 66-67 to col. 5, lines 1-15).

57.   As per claim 10, Zolnowsky further teaches the memory model is arranged to run in

either pre-emptible or non-preemptible modes (col. 5, lines 16-25).

58.   As per claim 11, Dahlstedt teaches a mutex is arranged to protect the module from

running in the pre-emptible mode (col. 2, lines 6-13 and 21-26).

59.   As per claim 25, it has similar limitations as claim 8 and is therefore rejecting using the

same rationale.

60.   As per claim 26, it has similar limitations as claim 9 and is therefore rejecting using the same rationale.

61.   As per claim 27, it has similar limitations as claim 10 and is therefore rejecting using the same rationale.

62.   As per claim 28, it has similar limitations as claim 11 and is therefore rejecting using the same rationale.

63.   Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zolnowsky in view of Vaid as applied to claim 1, and further in view of Sanches (US 2003/0018510).

64.   As per claim 15, Zolnowsky and Vaid fail to teach a mobile computing device.

65.   However, Sanches teaches a mobile computing device ([0292], lines 7-25).

66.   It would have been obvious to one of ordinary skill in the art at the time of the invention to combine a mobile device as taught by Sanches into the invention as taught by Zolnowsky, Vaid because it would allow for notifications to be sent in a low-priority background thread (see Sanches [0292], lines 19-25).

67.   As per claim 16, Sanches teaches a smart phone ([0292], lines 7-25).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Adam Lee whose telephone number is (571) 270-3369. The examiner can normally be reached on Monday to Friday 7:30 AM to 5:00 PM.

If attempts to reach the above noted Examiner by telephone are unsuccessful, the Examiner's supervisor, Emerson Puente, can be reached at the following telephone number: (571) 272-3652.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Adam Lee/
Examiner
Art Unit 2195

/Emerson C Puente/
Supervisory Patent Examiner, Art Unit 2195